B1 applying electric potential to at least one of the first or second electrodes so as to generate a plasma in the feed gas mixture and reduce the halogen-containing gas.

70. (Amended) A system for treating fluorine gas, comprising:

a non-thermal plasma reactor for converting fluorine gas to hydrogen fluoride;

B2 a fluorine gas source in fluid communication with the non-thermal plasma reactor; and

a liquid water source in fluid communication with the non-thermal plasma reactor.

Please add the following claims:

88. (New) A process for treating a halogen-containing gas, comprising:

providing a treatment gas that includes at least one halogen-containing gas;

providing a liquid;

vaporizing a portion of the liquid;

mixing the vaporized liquid portion with the treatment gas resulting in a reaction mixture; and

generating a non-thermal plasma in the reaction mixture in the presence of the non-vaporized portion of the liquid to reduce the halogen-containing gas.

B3 89. (New) The process according to claim 88, wherein the liquid comprises water.

90. (New) The process according to claim 88, wherein the vaporizing of a portion of the liquid is effected by the liquid absorbing heat produced by the reduction of the halogen-containing gas.

91. (New) A process for treating fluorine gas, comprising:

introducing fluorine gas into a chamber;

introducing liquid water into the chamber;

vaporizing a portion of the liquid water in the chamber; and

generating a plasma in the chamber in the presence of the non-vaporized portion of the liquid water to convert the fluorine gas to hydrogen fluoride gas.

92. (New) The process according to claim 91, wherein the plasma comprises a non-thermal plasma.

93. (New) A plasma reactor apparatus, comprising:

a chamber defining at least one gas inlet for introducing a treatment gas into the chamber, at least one liquid inlet for introducing a liquid into the chamber;

a first electrode disposed within the chamber and defining a first surface; and

a second electrode disposed within the chamber and defining a first surface that opposes the first surface of the first electrode to form a gap;

wherein the liquid inlet is in fluid communication with the gap between the first surface of the first electrode and the first surface of the second electrode such that a liquid film may be provided in the gap, and at least one of the first surface of the first electrode or the first surface of the second electrode forms a dielectric barrier.

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94. (New) A plasma reactor apparatus comprising:

a chamber defining an interior void and a wall;

a first electrode disposed within the chamber;

a second electrode disposed within the chamber;

means for generating a non-thermal plasma in a gap between the first electrode and the second electrode;

means for providing a liquid film in the gap between the first electrode and the second electrode; and

means for introducing a treatment gas into the gap between the first electrode and the second electrode.

95. (New) A system for treating a halogen-containing gas, comprising:

a non-thermal plasma reactor for reducing a halogen-containing gas;

a halogen-containing gas source in fluid communication with the non-thermal plasma reactor;

a fresh liquid source in fluid communication with the non-thermal plasma reactor; and